AU 97/00613

24 JUL 1998

CLAIMS:

1. A method of compacting a mat of hot mix asphalt which has been laid by an advancing asphalt paver, the method comprising advancing an asphalt compactor over the laid asphalt such that a compaction surface of the compactor, formed by a lower run of at least one belt, is engaged with any one portion of the mat for a period of at least 1.5 seconds, the compaction surface applying a maximum average load stress to the mat of less than about 50 kPa.

2. A method according to claim 1, wherein the asphalt compactor is advanced over the laid asphalt substantially at the rate of advancement of the asphalt paver and within about 50 m behind the asphalt paver.

3. A method according to claim 2, wherein the asphalt compactor is advanced substantially at the rate of the asphalt paver within about 2 m behind the asphalt paver.

4. A method according to claim 2 wherein the asphalt compactor is connected to and advanced by the asphalt paver.

5. A method according to claim 2 wherein the distance between the asphalt paver and the asphalt compactor is controlled via relative location sensor means.

6. A method according to claim 2, wherein the asphalt paver travels at a speed of from about 0.05 to about 0.15 m/s.

7. A method according to claim 9 wherein the asphalt paver travels at a speed of about 0.1 m/s.

8. A method according to claim 1, wherein the compactor is displaced over the mat at a rate of no more than about 0.7 m/s.

9. A method according to claim 1 wherein the asphalt paver travels at a speed of from about 0.05 to about 0.15 m/s.

10. A method according to claim 9 wherein the asphalt paver travels at a speed of about 0.1 m/s.

11. A method of compacting a mat of hot mix asphalt which has been laid by an advancing asphalt paver, the method comprising compacting the asphalt with a compactor having a compaction surface which engages the mat over a length of at least about 1 m wherein the compaction surface is formed by a lower run of at least one belt and wherein the compaction surface applies a maximum average load stress to the mat of less than about 50 kPa, and wherein the compactor is displaced over the mat at a rate of no more than about 0.7 m/s.

12. A method according to claim 1 or 11 wherein the total compaction duration is from about 7 seconds to about 60 seconds.

13. A method according to claim 12 wherein the total compaction time is at least 10 seconds.

14. A method according to claim 13 wherein the total compaction time is at least 15 seconds.

15. A method according to claim 1 or 11 wherein compaction is achieved in a single pass of the compactor over the mat.

16. A method according to claim 1 or 11 wherein the load stress is applied by two or more separate successive compactor surfaces which closely follow one another.

17. A method according to claim 11 wherein the rate of compaction is about 0.6 m/s or less.

PCT/AU 97/00613
24 JUL 1998

9. A method according to claim 1 wherein the rate of compaction is from about 0.6 m/s to about 0.05 m/s.

10. A method according to claim 1, wherein the total compaction duration is from about 7 seconds to about 60 seconds.

11. A method according to claim 1, wherein compaction is achieved in a single pass of the compactor over the mat.

12. A method according to claim 1, comprising two or more separate successive compaction steps by the compaction surface or by two or more separate compaction surfaces which closely follow one another, each of said compaction steps comprising engaging said compaction surface or one of said two or more compaction surfaces with any one portion of the mat for a period of at least 1.5 seconds.

13. A method according to claim 1, wherein the average load stress applied through the compaction surface is from about 10 kPa to about 40 kPa.

14. A method according to claim 1, wherein the applied load stress increases gradually from the leading edge of the compaction surface to the trailing edge of the compaction surface.

15. A method according to claim 14, wherein the maximum line stress at the trailing edge of the compaction surface is about 40 kPa and the maximum average applied load stress is about 25 kPa.

16. A method according to claim 1, wherein the compactor belt is heated to at least the temperature of the asphalt mat.

17. A method according to claim 16, wherein the compactor belt is heated to a

18. A method according to claim 17 wherein the rate of compaction is from about 0.6 m/s to about 0.05 m/s.

19. A method according to claim 18 wherein the rate of compaction is from about 0.5 m/s to about 0.1 m/s.

20. A method according to claim 1 or 11 wherein the average load stress applied through the compaction surface is from about 10 kPa to about 40 kPa.

21. A method according to claim 20 wherein the average load stress applied through the compaction surface is about 25 kPa or less.

22. A method according to claim 1 or 11 wherein the applied load stress increases gradually from the leading edge of the compaction surface to the trailing edge of the compaction surface.

23. A method according to claim 22 wherein the maximum line stress at the trailing edge of the compaction surface is about 40 kPa and the maximum average applied load stress is about 25 kPa.

24. A method according to claim 11 wherein the compactor belt is heated to at least the temperature of the asphalt mat.

25. A method according to claim 24 wherein the compactor belt is heated to a temperature in the range of from about 120°C to about 150°C or more.

26. A method according to claim 24 wherein the compactor belt is heated such that the bitumen on the surface of the asphalt mat substantially does not adhere to the compactor belt during compaction.

temperature in the range of from about 120°C to about 150°C or more.

18. A method according to claim 16, wherein the compactor belt is heated such that the bitumen on the surface of the asphalt mat substantially does not adhere to the compactor belt during compaction.

19. A compactor comprising at least two longitudinally spaced modular compaction units connected relative to each other and a power source for driving at least one of the modular compaction units, wherein at least one of the modular compaction units is adjustable to permit steering of the compactor, and wherein each of said modular compaction units comprises a compaction belt and support means for the belt to define a planar lower run of the belt forming a compaction surface.

20. A compactor according to claim 19, wherein the two modular compaction units are pivotally connected relative to each other.

21. A compactor according to claim 19 wherein the belt lower run in each of the modular compaction units is at least 1 m long.

22. A compactor according to claim 19, wherein in each modular compaction unit the belt is supported for rotation by two or more drums or rollers between which the belt extends.

23. A compactor according to claim 22 wherein in each modular compaction unit the belt extends between two large diameter drums or a single larger diameter drum at the leading end of the respective compaction unit, which is optionally driven, and two smaller drums or rollers respectively defining the upper and lower runs of the belt at the trailing end of the respective compaction unit.

24. A compactor according to claim 22, wherein in each modular compaction unit the lower run of the belt extends between two relatively small drums or rollers, and wherein at

27. A compactor comprising two longitudinally spaced rotatable support assemblies connected relative to each other, and a power source for rotationally driving at least one of the rotatable support assemblies, wherein at least one of the support assemblies is adjustable to permit steering of the compactor, and wherein at least one of the support assemblies comprises a modular compaction unit comprising a compaction belt, support means for the belt to define a planar lower run of the belt forming a compaction surface.

28. A compactor according to claim 27 wherein one of the support assemblies comprises a modular compaction unit, the other support assembly relative to which it is connected comprising a steerable tractor unit or an asphalt paver.

29. A compactor according to claim 28 wherein the modular compaction unit is pivotally connected relative to the other support assembly.

30. A compactor according to claim 27 wherein one of the support assemblies comprises a modular compaction unit and the other support assembly comprises two belt compactors connected side-by-side, optionally in spaced apart manner with the one modular compaction unit adapted to compact the portion of a surface of material to be compacted between the spaced belt compactors.

31. A compactor according to claim 30 wherein the the two spaced belt compactors are pivotally connected relative to the modular compaction unit.

32. A compactor according to claim 27 wherein both of the support assemblies comprise modular compaction units, each support assembly comprising a compaction belt, support means for the belt to define a planar lower run of the belt forming a compaction surface.

33. A compactor according to claim 32 wherein the two modular compaction units are pivotally connected relative to each other.

PCT/AU 97/00617
24 JUL 1998

least one upper roller, which may optionally be larger than the two relatively small drums or rollers, supports the upper run of the belt.

25. A compactor according to claim 19, wherein in each modular compaction unit between the leading and trailing ends of the lower run the belt is supported or engaged to provide the desired constant or gradually increasing load stress to the surface of the material to be compacted.

26. A compactor according to claim 19, wherein each of the belts comprises elastomeric material, a series of pivotally interconnected rigid segments or is formed of mesh or woven wire.

27. A compactor according to claim 19, wherein in each modular compaction unit except for its lower run the belt is enclosed within the respective compaction unit.

28. A compactor according to claim 27, wherein each belt is enclosed in part or wholly by a respective insulating shroud which optionally extends over the belt substantially to the level of the compaction surface.

29. A compactor according to claim 27, wherein each belt is partly enclosed by a respective support system for the belt.

30. A compactor according to claim 19, comprising heating means for heating each of the compactor belts.

31. A compactor according to claim 19, wherein a respective drum or roller associated with each compactor belt acts as a reservoir for hot liquid.

32. A compactor according to claim 19 wherein a hot liquid reservoir is provided between two drums or rollers associated with each of the compactor belts, or adjacent a single such

34. A compactor according to claim 27 wherein the modular compaction unit or at least one of the modular compaction units is driven.

35. A compactor according to claim 27 wherein the belt lower run in the or each modular compaction unit is at least 1 m long.

36. A compactor according to claim 27 wherein the belt is supported for rotation on the compactor by two or more drums or rollers between which the belt extends.

37. A compactor according to claim 36 wherein the belt extends between two large diameter drums or a single larger diameter drum at the leading end of the compactor, which is optionally driven, and two smaller drums or rollers respectively defining the upper and lower runs of the belt at the trailing end of the compactor.

38. A compactor according to claim 36 wherein the lower run of the belt extends between two relatively small drums or rollers, and wherein at least one upper roller, which may optionally be larger than the two relatively small drums or rollers, supports the upper run of the belt.

39. A compactor according to claim 27 wherein, between the leading and trailing ends of the lower run, the belt is supported or engaged to provide the desired constant or gradually increasing load stress to the surface of the material to be compacted.

40. A compactor according to claim 27 wherein the belt comprises elastomeric material, a series of pivotally interconnected rigid segments or is formed of mesh or woven wire.

41. A compactor according to claim 27 wherein, except for its lower run, the belt is enclosed within the compactor.

PCT/AU 97/00

24 JUL 1997

drum or roller.

33. A method of compacting a mat of hot mix asphalt comprising compacting the mat using a compactor as claimed in claim 19.

5

42. A compactor according to claim 41 wherein the belt is enclosed in part or wholly by an insulating shroud which optionally extends over the belt substantially to the level of the compaction surface.

43. A compactor according to claim 41 wherein the belt is partly enclosed by a support system for the belt.

44. A compactor according to claim 27 further comprising heating means for heating the compactor belt.

45. A compactor according to claim 27 wherein a drum or roller associated with the compactor belt acts as a reservoir for hot liquid.

46. A compactor according to claim 27 wherein a hot liquid reservoir is provided between two drums or rollers associated with the compactor belt, or adjacent a single such drum or roller.

47. A method of compacting a mat of hot mix asphalt comprising compacting the mat using a compactor as claimed in claim 27.